

AMENDMENTS TO THE CLAIMS

The listing of claims below replaces all prior versions of claims in the application.

1. (Currently Amended) Ink comprising:

a primary particle of a copolymer that has a glass transition point less than or equal to ~~50~~ to 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of ~~either styrene or styrene derivative~~;

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, ~~alkyl acrylate derivative substituted or unsubstituted acrylate or alkyl metaacrylate derivative substituted or unsubstituted alkyl metacrylate~~; and

(c) ~~1 or more~~ 5 through 10 wt% of ~~polymeric monomer including a polar group~~, the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant, and

a solvent that is liquid at room ~~temperature~~, temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

2-3. (Canceled)

4. (Currently Amended) The ink according to claim 1, wherein said copolymer has a glass transition point ranging from -30 ~~through 45~~ through 65°C.

5. (Canceled)

6. (Original) The ink according to claim 1, wherein said colorant comprises one selected from the group consisting of a pigment and a dye, and said colorant is dissolved or dispersed in said primary particle of a copolymer.

7. (Original) The ink according to claim 1, wherein said colorant comprises one selected from the group consisting of a pigment and a dye, and said colorant is absorbed on or coats a surface of said copolymer.

8. (Original) The ink according to claim 1, wherein said colorant comprises one selected from the group consisting of a pigment and a dye, and said colorant is dissolved or dispersed in said solvent.

9. (Original) The ink according to claim 1, wherein said copolymer is included at 1 through 50 wt%.

10. (Original) The ink according to claim 1, wherein said colorant is included at 0.1 through 20 wt%.

11-13. (Canceled)

14. (Currently Amended) Ink comprising:

a copolymer particle that has a glass transition point less than or equal to ~~50~~ 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.05 through 1 μ m obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of ~~either styrene or styrene derivative~~;

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, ~~alkyl acrylate derivative substituted or unsubstituted acrylate or alkyl metaacrylate derivative substituted or unsubstituted alkyl metacrylate~~; and

(c) ~~1 or more~~ 5 through 10 wt% of ~~polymeric monomer including a polar group~~, the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;
a colorant; and

a solvent that is liquid at room ~~temperature~~, temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

15. (Original) The ink according to claim 14, further comprising a surfactant covering a surface of said copolymer particle.

16. (Currently Amended) An ink cartridge including a case and ink which is stored in said case and comprises:

a copolymer particle that has a glass transition point less than or equal to ~~50~~ 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

(a) 20 through 99 wt% of ~~either styrene or styrene derivative~~; and

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, ~~alkyl acrylate derivative~~ substituted or unsubstituted acrylate or alkyl metaacrylate derivative substituted or unsubstituted alkyl metacrylate; and

(c) 5 through 10 wt% of ~~polymeric monomer including a polar group~~, the
polymeric monomer including a polar group selected from the group consisting of acrylic
acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate,
vinylpyridine and N, N-diallylmethylammonium chloride;
a colorant; and
a solvent that is liquid at room ~~temperature~~, temperature;
wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in
said solvent with said copolymer particles by absorption on or coating a surface of said
copolymer particles, but said colorant is not dissolved in said solvent; and
wherein the primary particle of the copolymer is prepared by a polymerization process
selected from the group consisting of an emulsion polymerization, a micro emulsion
polymerization and a soap-free polymerization.

17. (Currently Amended) A recording device including a head and an ink cartridge
supplying ink to said head, wherein said ink comprises:

a copolymer particle that has a glass transition point less than or equal to ~~50~~ to 65 °C, a
softening point measured by a flow tester ranging from 40 through 150 °C and a volume average
particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer
composition consisting essentially of:

(a) 20 through 99 wt% of either styrene ~~or styrene derivative~~; and

(b) 10 through 80 wt% of alkyl acrylate, alkyl methacrylate, ~~alkyl acrylate derivative~~ substituted or unsubstituted acrylate or alkyl metaacrylate derivative substituted or unsubstituted alkyl metacrylate; and

(c) ~~1 or more~~ 5 through 10 wt% of ~~polymeric monomer including a polar group,~~ the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;
a colorant; and

a solvent that is liquid at room ~~temperature~~, temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

18-19. (Canceled)

20. (Currently Amended) Ink comprising:

a primary particle of a copolymer that has a glass transition point ~~-30 through 50~~ through 65°C, a softening point measured by a flow tester ranging from 40 through 150°C and a volume

average particle diameter ranging from 0.05 through 1 μm obtained from a radical polymeric monomer composition consisting essentially of:

- (a) 20 through 99 wt% of styrene;
- (b) 10 through 80 wt% of alkyl acrylate, or alkyl methacrylate; and
- (c) ~~1 or more~~ 5 through 10 wt% of ~~polymeric monomer including a polar group,~~

the polymeric monomer including a polar group selected from the group consisting of acrylic acid, methacrylic acid, 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride;

a colorant; and

a solvent that is liquid at room ~~temperature,~~ temperature;

wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in said solvent; and

wherein the primary particle of the copolymer is prepared by a polymerization process selected from the group consisting of an emulsion polymerization, a micro emulsion polymerization and a soap-free polymerization.

21. (New) The ink of claim 1, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride.

22. (New) The ink of claim 14, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride.

23. (New) The ink of claim 16, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride.

24. (New) The ink of claim 17, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride.

25. (New) The ink of claim 20, wherein said polymeric monomer is one selected from the group consisting of 2-hydroxypropyl-N, N, N-trimethylammonium chloride acrylate, vinylpyridine and N, N-diallylmethylammonium chloride.